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What is claimed is:

1. A polynucleotide comprising a first promoter derived from a gene encoding a co-stimulatory molecule and a first sequence encoding at least one antigen wherein said first sequence is operably linked to said first promoter.
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2. The polynucleotide of claim 1, wherein the promoter is derived from a CD80 (B7-1) gene.
- 10 3. The polynucleotide of claim 1, wherein the promoter is derived from a CD86 (B7-2) gene.
4. The polynucleotide of claim 1, further comprising a second sequence encoding at least one cytokine operably linked to the first promoter.
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5. The polynucleotide of claim 4, wherein the cytokine is selected from the group consisting of CD40 ligand (CD40L), tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand.
- 20 6. The polynucleotide of claim 1, further comprising a second sequence encoding at least one cytokine and a second promoter, wherein the second sequence is operably linked to the second promoter.
7. The polynucleotide of claim 6, wherein said second promoter is a constitutive promoter.
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8. The polynucleotide of claim 6, wherein the cytokine is selected from the group consisting of CD40 ligand (CD40L), tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand.

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9. A core carrier coated with a polynucleotide according to claim 1.
10. The carrier of claim 9, wherein the carrier is comprised of gold.
- 5 11. A pharmaceutical composition, comprising a polynucleotide according to claim 1 and a pharmaceutically acceptable excipient.
12. The pharmaceutical composition of claim 11, further comprising a cytokine.
- 10 13. The pharmaceutical composition of claim 12, wherein the cytokine is selected from the group consisting of CD40L, tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand.
- 15 14. A method for eliciting an immune response in a vertebrate subject, said method comprising:
- (a) providing a nucleotide sequence encoding an antigen operably linked to a promoter derived from a gene encoding a co-stimulatory molecule, said promoter capable of directing the expression of said antigen in the
- 20 subject; and
- (b) administering the nucleotide sequence to the subject, whereby the antigen is expressed in an amount sufficient to elicit an immune response.
15. The method of claim 14, wherein the co-stimulatory molecule is CD80 or CD86.
- 25 16. The method of claim 14, further comprising the step of administering at least one cytokine to the subject.

17. The method of claim 16, wherein the cytokine is administered as a polynucleotide encoding the at least one cytokine.
18. The method of claim 16, wherein the cytokine is administered as a protein.
19. The method of claim 16, wherein the cytokine is selected from the group consisting of CD40L, tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand (flt-3L).
20. A method for eliciting an immune response in a vertebrate subject, said method comprising:
- (a) providing a core carrier particle coated with a nucleotide sequence encoding at least one antigen, said nucleotide sequence operably linked to a promoter derived from a gene encoding a co-stimulatory factor, wherein said promoter is capable of driving expression of the antigen-encoding sequence in the subject; and
 - (b) administering the coated particle to the subject using a particle-mediated transdermal delivery technique, whereby the antigen is expressed in an amount sufficient to elicit an immune response.
21. The method of claim 20 wherein the core carrier particle is a gold particle.
22. The method of claim 20, wherein the nucleotide sequence further comprises a sequence encoding a cytokine selected from the group consisting of TRANCE, CD40L and flt-3L.

23. The method of claim 20, further comprising administering to the subject a cytokine selected from the group consisting of TRANCE, CD40L and flt-3L.

5 24. The method of claim 20, wherein step (b) is repeated to provide a prime and a booster administration.

25. The method of claim 24, wherein the core carrier particle is a gold particle.

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26. A vaccine composition comprising:

(a) an expression vector comprising a polynucleotide encoding at least one antigen; and

15 (b) at least one cytokine selected from the group consisting of CD40 ligand (CD40L), tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand (flt-3L).

27. A vaccine composition comprising:

(a) at least one peptide antigen; and

20 (b) an expression vector comprising a polynucleotide encoding at least one cytokine selected from the group consisting of CD40 ligand (CD40L), tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand (flt-3L).

25 28. A vaccine composition comprising:

(a) at least one peptide antigen; and

(b) at least one cytokine selected from the group consisting of CD40 ligand (CD40L), tumor-necrosis factor-related activation-induced cytokine (TRANCE) and Flt3 ligand (flt-3L).

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29. The vaccine composition according to claim 26, wherein the polynucleotide and/or the at least one cytokine is coated onto a core carrier.
30. The vaccine composition according to claim 27, wherein the
5 polynucleotide and/or the at least one peptide antigen is coated onto a core carrier.
31. The vaccine composition according to claim 28, wherein the at least
10 one peptide antigen and/or the at least one cytokine is coated onto a core carrier.
32. A method for eliciting an immune response in a vertebrate subject, said method comprising:
15 (a) providing a vaccine composition according to claim 26; and
(b) administering the composition to the subject, whereby the antigen is expressed in an amount sufficient to elicit an immune response.
33. A method for eliciting an immune response in a vertebrate subject, said method comprising:
20 (a) providing a vaccine composition according to claim 27; and
(b) administering the composition to the subject in an amount sufficient to elicit an immune response.
34. A method for eliciting an immune response in a vertebrate subject, said
25 method comprising:
(a) providing a vaccine composition according to claim 28; and
(b) administering the composition to the subject in an amount sufficient to elicit an immune response.

35. A method for eliciting an immune response in a vertebrate subject, said method comprising:

- (a) providing a vaccine composition according to claim 29; and
- (b) administering the composition of step (a) to the subject using a

5 particle-mediated delivery technique.

36. The method of claim 35, wherein the core carrier is a gold particle.

37. The method of claim 35, wherein step (b) is repeated to provide a
10 prime and a booster administration.

38. A method for eliciting an immune response in a vertebrate subject, said method comprising:

- (a) providing a vaccine composition according to claim 30; and
- (b) administering the composition of step (a) to the subject using a

15 particle-mediated delivery technique.

39. The method of claim 38, wherein step (b) is repeated to provide a
prime and a booster administration.

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40. A method for eliciting an immune response in a vertebrate subject, said method comprising:

- (a) providing a vaccine composition according to claim 31; and
- (b) administering the composition of step (a) to the subject using a

25 particle-mediated delivery technique.

41. The method of claim 40, wherein step (b) is repeated to provide a
prime and a booster administration.